

ABSTRACT OF THE DISCLOSURE

A system and method for determining the dielectric properties associated with a substrate. In one embodiment, a network analyzer measures scattering parameters for at least two lines of substantially identical cross-section embedded within the substrate over a specified frequency range. A first engine determines a complex propagation constant based on the scattering parameters and defines the complex propagation constant in terms of an attenuation component and a phase component. A second engine, responsive to the phase component, determines a relative permittivity parameter associated with the substrate over the specified frequency range. A third engine, responsive to the attenuation component and the relative permittivity parameter, performs a least squares analysis to determine a loss tangent parameter associated with the substrate over the specified frequency range.